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Rose Technic Staff
Rose-Hulman Institute of Technology

ROSE TECHNIC

DECEMBER, 1940

MEMBER
ECMA

To all Students of

Rose Polytechnic Institute

past, present and future

Christmas Greetings

and

Best Wishes for the New Year

ROSE TECHNIC

VOLUME L DECEMBER 1940 NUMBER 3

CONTENTS

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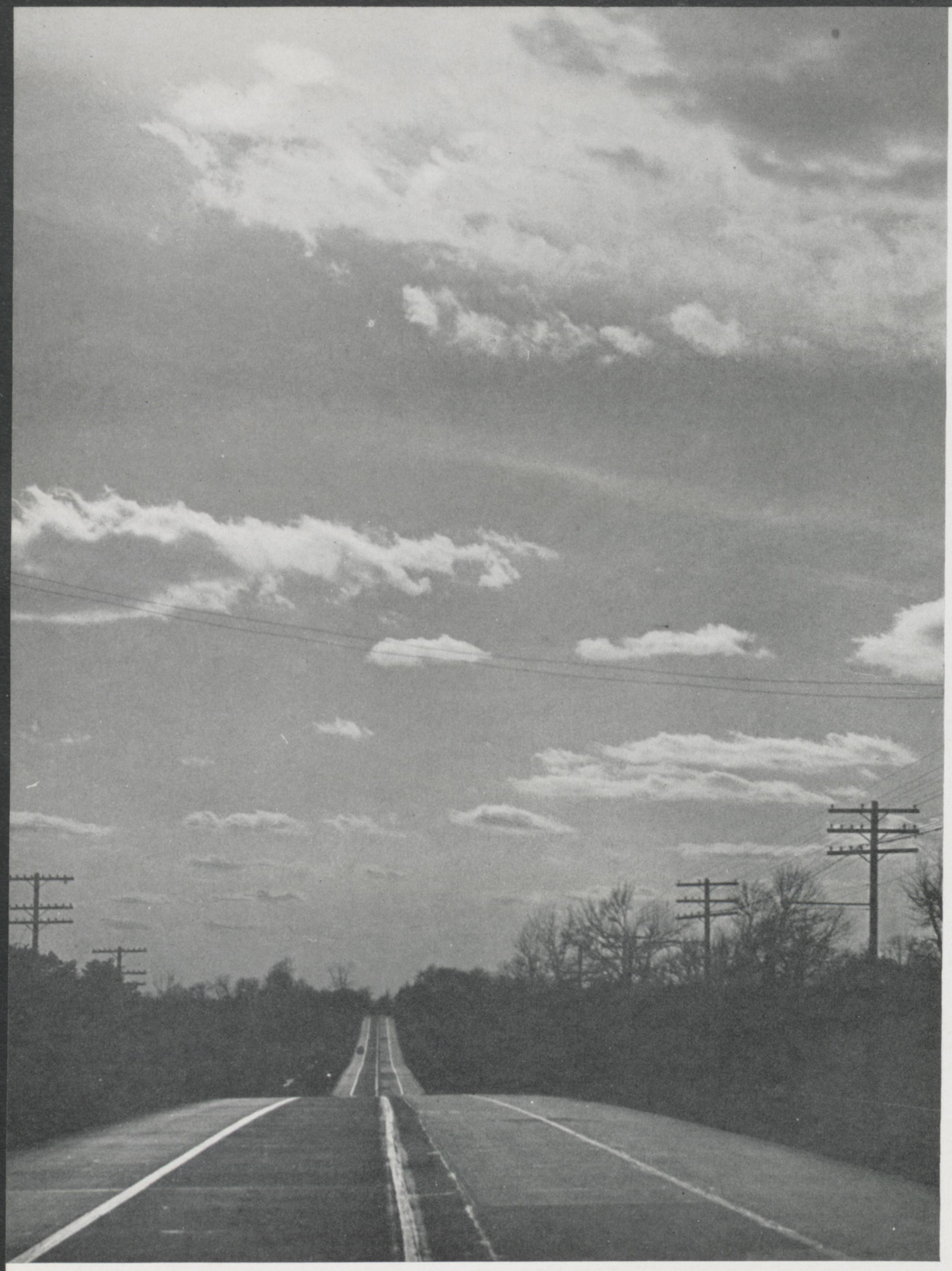


Photo by McWilliams

"You take the high road,
And I'll take the low road . . ."

The open road seems to be the theme suggested to the editors by this wintry view of the Old National Highway, U. S. 40, past Rose. Mr. Tracy in his article "Gearing for War" suggests that the Selective Service should operate to keep the road open for industrial employment of the engineer, since he will serve in this capacity more efficiently than with troops.

GEARING FOR WAR

TAU BETA PI PRIZE WINNING ESSAY

WHEN, in 1917, we entered the first World War we were almost totally unprepared for such an undertaking. Our standing army was ridiculously small and ill-equipped. Had it not been for our allies who held the enemy in check while an army was raised, trained, equipped, and transported overseas, we might well have been defeated. Today, faced with the possibility of another struggle, the people of the United States, while determined to remain out of the war if possible, are equally determined to avoid the mistakes made in 1917. We cannot afford to take the chance that we might not have to fight. We must be prepared to protect our rights and if necessary fight for our liberty. We must therefore prepare to meet any emergency.

The question has often been raised by engineers and engineering students as to how they will fit into the preparedness program. Will they take part in the actual fighting or will they be placed in some other, equally important service?

Statistics show that there is a great shortage of engineers. Engineers are needed to help organize industry, to devise machines and methods of turning out war materials, and to convert plants designed to turn out peace time articles into ones that can produce tanks, guns, ammunition, and many other articles needed in time of war. It has been estimated that at the present rate at which engineers are being graduated from our colleges it would take five or six years to make up the shortage which now exists. How, then, can these requirements be met?

There are several points which might be considered in this connection. Briefly they are:

1. Make use of all available engineers. This for the most part means excusing them from actual military service. Of course some engineers will be needed as officers in the Engineers Corps, but this number should be cut down to a minimum. Engineers with no previous military training should not be taken into the army but should be placed in industry in such a manner as to make the best use of their abilities and training. How this can be done is a problem in itself.

2. Speed up the education of engineers. It has been suggested that engineering colleges have a summer term. A four-year course would then be completed in three years. This would undoubtedly work a hardship on the students, but in time of emergency it is up to each citizen to sacrifice his personal comfort for the good of his country.

3. Conduct short courses in specialized subjects for high-school graduates or for those who have had one or two years of college and who are not now qualified to hold an important place in the program. For instance, a person with little or no technical knowledge might be taught in a short time to inspect castings, which is, of course, an important job. The utilization of such men in important but routine positions would release many engineers for positions requiring more technical knowledge.

Some discussion will surely be raised over the idea of excusing engineers from actual military service. Men in other branches of industry will ask, "If engineers are exempted why shouldn't we be?" The answer is, of course, that many of them should and will be excused, but only those who will be of greater value in the industrial mobilization than in the military mobilization.

In conclusion, it seems that if the preparedness program is carried out efficiently and successfully the place for most engineers will be in industry. There he will be serving his country every bit as faithfully as the man in the uniform.

by John E. Tracy, e.e., '41

X-RAYING INDUSTRY

by Winston H. Cundiff, ch.e., '42

X-rays are no longer laboratory curiosities, but new developments have made them useful tools for the engineer. For many years they have been used by doctors and dentists to detect fractures and decay. They are now being used to detect these same faults in industrial products.

In his article Mr. Cundiff presents a brief history of the development and perfection of X-ray equipment. Of special interest to the engineering student is his discussion of the important, new industrial uses which have been devised for X-rays.

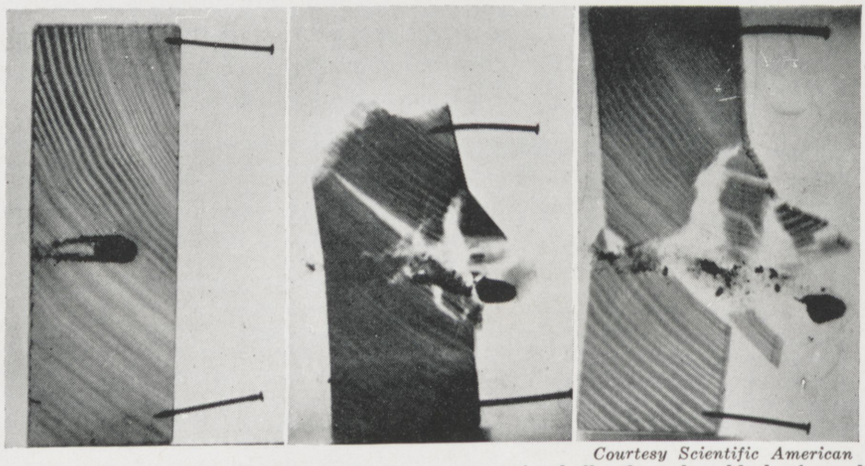
IN 1895, in his laboratory in Wurzburg, Bavaria, Professor Rontgen, a German physicist, with his discovery of the phenomena of X-rays, opened the door to a field of experimentation whose subsequent results were to provide invaluable information to add to the world's scientific literature concerning atomic structure, engineering, crystallography, medicine, bacteriology, and philosophy. Practically revolutionizing the field of medicine in past years, X-rays are now becoming indispensable to the field of industry. The extent of the application of X-rays appears interminable, and one cannot fully appreciate their usefulness in industry without a thorough knowledge of the development and the extreme uses to which X-rays are now subjected.

Although the non-medical applications of X-rays are of comparatively modern development, many experiments and uses were suggested soon after their discovery. One interesting application called the Izombard process of printing by X-rays was set up experimentally in 1899. A number of sensitized sheets were piled up, and the copy whose ink was semi-opaque to X-rays was placed on top. The whole mass was then radiographed, and it was found that a mass of paper 2" thick could be successfully printed without undue distortion. Needless to say, obvious practical difficulties caused this system to be abandoned.

The practical significance of the radiography of metals was recognized as early as 1896, one year after the discovery of the X-ray, when Professor Wright (Yale) radiographed a metallic weld and disclosed a fracture which was not apparent upon external examination. So far, radiography is the only method yet discovered by which the mechanical strength of welds can be estimated without destroying the weld. Modern industrial applications of the X-ray fall into two divisions: radiography or photographic methods, and X-ray crystal analysis. Radiography, however, is the more important. Flaws and cracks constantly appear in engineering materials only after expensive machining or use. If X-rays could be used to examine all castings, this method would be used universally, but there is a limiting thickness. The complicated form of some castings bars them from inspection by X-rays. The X-ray photographs of castings reveal departures from homogeneity in the form of blowholes, cracks, and gas inclusions. The interpretation of these photographs in terms of mechanical strength requires some expericence, but to the trained observer the radiograph becomes an infallible guide to the soundness of the material. By stereoscopic methods the position and dimensions of internal flaws can be determined with great accuracy.

Another X-ray application is the inspection of assembled products, the successful unit operation of which depends upon the correctness and completeness with which its constituent parts are installed. In such cases X-ray installations have displaced clumsy, inefficient, expensive inspection systems. Golf balls are inspected in this manner to determine the accuracy with which their cores are centered. Many food packers also use this method of inspecting finished products for foreign objects which may have passed unnoticed through screens, separators, and electric eyes.

Practically all airplane parts subject to strain are analyzed by X-ray before passing final inspection, and all steam tubing used in warships is radiographed, forestalling failure in crucial moments. The development of X-ray apparatus has resulted in the production of portable outfits for various purposes. One public utility company uses such a unit to inspect poles as they stand, thereby saving the needless expense of replacing poles whose exterior appear-



Courtesy Scientific American

High speed X-ray photographs show the progress of a bullet through a block of wood.

ance is doubtful but whose main bodies are sound. Plumbers and builders are using portable X-ray apparatus to locate wires and pipes in the walls of buildings and to determine the extent of corrosion in ferro-concrete structures. California and Arizona fruit growers use one hundred X-ray machines to inspect their fruit crop. Recently after a severe frost California growers salvaged two million crates of oranges worth seven million five hundred thousand dollars by means of X-ray examination of the fruit. Under ordinary methods of external examination it is impossible to detect a frost-bitten orange from a good one. The modern filling-station attendant's "X-ray your tires" will soon be as commonplace as his "check your oil, sir", for radiographs of tires while on the wheel can prevent many accidents caused by casing failures. X-rays are working with science in the explosives industries determining how explosive properties and general sensitivity and stability are affected by changes in atomic arrangement.

Discovery

While experimenting with a highly exhausted Crooks' vacuum tube (fig. 1) on the conduction of electricity through gases at low pressures, Rontgen observed that some barium platinocyanide crystals which were in the vicinity of the apparatus became brilliantly flourescent although the discharge tube was covered with black paper which completely screened off the visible light emitted. He further observed that when objects were placed between the screened tube and a card on which the crystals were spread, they cast a shadow on the card. In this manner Rontgen was the first to discover, though not the first to produce, what he then called X-ray, rays which we now call in honor of their discoverer Rontgen rays. Rontgen rays are located on the spectrum band beyond the ultra-violet rays as we progress toward radiation of shorter wave length. To give a further clarification to the relative energy properties of Rontgen rays, the quantum theory compares the number of volts necessary to produce a given radiation by electrical discharge with the wave length of that particular radiation. In this relationship visible light rays correspond to a few volts, while Rontgen rays range from 100 to 100,000 volts. Three remarkable properties which these newly discovered rays possessed were: 1, the power to pass through materials which were opaque to ordinary light; 2, the ability to cause luminescence in certain materials; 3, the ability to ionize gases and make them conductors of electricity. These last two properties led to methods of measurement of the intensity of the radiation produced by observing these phenomena quantitatively.

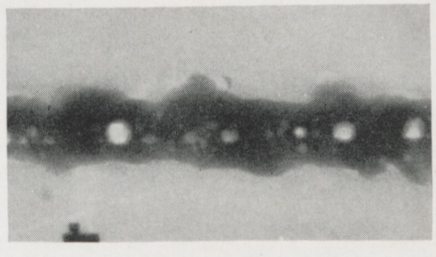
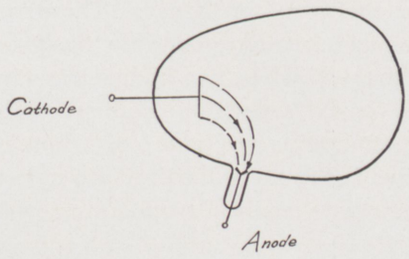


Photo Courtesy Iron Age
Flaws and blow holes are shown in the weld metal by the X-ray photograph.

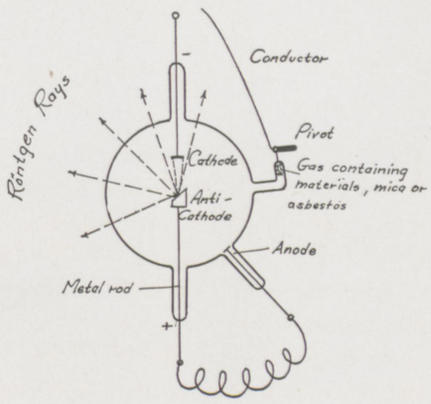
Figure I
Crooks Tube



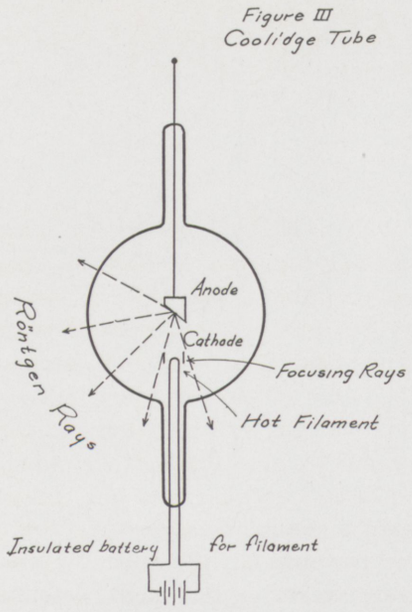
Since the time of Rontgen's discovery with the Crooks tube, several tubes have been designed and built which produce the required radiation more efficiently and in a more concentrated beam. The principal difference in these tubes is the method used to supply the electrons for the cathode stream.

In the old Rontgen tube (fig. 2) the electrons were supplied by a small amount of gas in the tube at low pressure. In the tube the electron stream under high potential moved from the cathode to the anti-cathode or to the target, early made of platinum and later tungsten.

Figure II
Röntgen Ray Tube



One of the principal difficulties in the operation of the old type Rontgen tube was encountered when extremely high voltage discharges were used and the target was heated to elevated temperatures. Upon cooling, the target adsorbed or dissolved the residual gas in the tube, and the electrical discharge necessary for the excitation of the atoms on the target could not be obtained because there were no ions present to carry the current. To surmount this difficulty a small tube containing a gas-bearing material was incorporated in the side wall of the main bulb of the tube. When the supply of the residual gas became low, this tube was connected by means of a metallic conductor to the cathode (Fig. II), and the resulting discharge through the gas-containing substance liberated the small amount of gas necessary for operation. This procedure required an experienced X-ray technician for satisfactory performance since the character of the X-rays depends upon the current which in turn depends upon the number of ions present as conductors. The anode in the old Rontgen tube was formerly thought to be of aid in focusing the electron stream on the target, but this has been proved to be false. Actually the function of the anode on this score



was negligible. Later tube designers eliminated this extra anode entirely and were highly successful with their resulting apparatus.

The Coolidge tube (fig. 3) developed by Dr. Coolidge in 1913 depends upon the evaporation of electrons from an incandescent filament for its supply of electrons to the cathode stream. The target of the Coolidge tube is solid tungsten. Another form of the hot cathode ray tube was developed at about this time by Lilienfeld of Germany. In Lilienfeld's apparatus the electrons were produced in a reservoir and "boosted" by means of an auxiliary high tension circuit to a small opening communicating with the main tube. Here, the principal high potential circuit hurled them across the tube to the target at extremely high velocities. One other type of X-ray tube to be mentioned is the "Metalix", whose merit lies in the fact that it is made, to a large degree, from metal. It emits rays through a small opening and therefore eliminates the use of clumsy "tube boxes" which were formerly necessary to protect the operator from the powerful radiations.

The formation of X-rays is in all cases due to the excitation of atoms on the target by the impact of the electrons which are moving at very high speeds. It is thought that the atoms on the target absorb kinetic energy from the exchange of momentum and re-radiate this energy in the form of X-rays. These are somewhat analogous to the flashes of light seen when two bodies traveling at high velocities collide. The outstanding attribute of Rontgen rays is the fact that they are able to penetrate materials opaque to ordinary light. The degree of penetration is dependent upon the atomic weights of the chemical elements in the material, penetration being greater into elements with low atomic weights.

In conclusion, the discovery and study of X-rays has had an especially important influence on the development of physics. The properties of conducting gases led to the discovery of electrons and radioactive bodies. The diffraction of X-rays by crystals has given new life to crystallography and to the study of the whole of the fine structure of matter. At the same time it enabled X-ray spectra to be obtained. The last, through Mosely's law, has rendered the unity of the structure of the chemical elements indisputable and supplied to the Bohr atom its strongest support. The high frequency of X-rays brings out more clearly the role of light quanta and verifies Einstein's law on the photoelectric effect. X-rays afford ground particularly favorable to the growth of new ideas concerning the theories of radiation, ideas which may one day lead to the unifying of the wave and the corpuscular theories of radiation.

CUE FOR COMMENT

The Technic staff would like to gripe. At the risk of marring the yuletide spirit and the pleasures of vacation, we would like to lament. We have worked hard (some have, anyhow) to put out a good magazine. For last year's cover design by Allen T. Wilson we won HONORABLE MENTION and through John E. Bartmess's contributions to the Alumni Section we have the FIRST place among the 24 magazines of the E. C. M. A. And that competition is pretty stiff!

But what does that mean? There are awards on every section of the magazine. There are awards for feature articles, editorials, illustrations, and above all for the BEST ALL-AROUND MAGAZINE. There is absolutely no reason why we can't have a few of those laurels for Rose. We think we've been putting out a good magazine, but now on this eve of yearly resolution, we want to plan for an even better magazine for next year. And that is our trouble—as the Chemical might put it, we've hit an end point, or, as the M.E. or double E. would have it, we're at a point of maximum efficiency. In plain words, however, we're in a RUT! Perhaps a high rut, yet with help it could be higher. I say, "with help," because we don't KNOW what to do!

We can't criticize the work we've been over and over, while YOU can! We can't find what won't be liked in hours of reading through these 28 pages, yet in a few minutes YOU may be pleased or disgusted with the material you find printed in YOUR magazine. Yet we'll not KNOW unless YOU TELL US! That is the Christmas greeting we want from you. We hope you can raise—the proverbial—with us for something you don't like in the Technic. Rest assured WE'LL appreciate YOUR Christmas comments.

Then, but not until, the staff of the *Rose Technic* extends its heartiest wishes to all who find their way into this part of the magazine a most enjoyable vacation, a MERRY CHRISTMAS, and a continued HAPPY NEW YEAR! —*The Editor*

SECONDARY ALUMINUM

by Richard O. Driskell, m.e., '43

The production of enough metal for our increased industrial activity and national defense needs has become a major problem. It would be even more difficult if all of the metal had to be won from the ore. Today, large quantities of secondary or reclaimed metals are being used. The rise in prices and diminution of the supply has made this a desirable and profitable enterprise.

Mr. Driskell discusses the secondary aluminum industry, including collecting, testing, and remelting the scrap and solves the problems that are met at each step.

SECONDARY metals are of great importance in the economic system of the world. J. P. Dunlop of the United States Bureau of Mines, in defining secondary metals, says: Secondary metals are those recovered from scrap metals, sweepings, skimmings, and drosses, and are so called to distinguish them from metals derived from ores, which are termed 'primary metals.' The distinction does not imply that secondary metals are of inferior quality, for metals derived either from ore or from waste material vary in purity and in adaptability to use in making certain products.

The importance of secondary metals can be shown by the fact that the annual turnover of scrap metals is equal to about half the output of primary metal.

The main industrial section of the United States lies north of the Ohio River and east of the Mississippi River. The important scrap metal dealers are situated in this area. Metal that is collected in other sections is shipped to the larger dealers in such cities as Detroit, Cleveland, Chicago, Buffalo, St. Louis, Pittsburgh, and Cincinnati. The scrap is collected by small junk dealers who ship the metal to the larger dealers. The remelters obtain their scrap from these large dealers. There are about six central aluminum remelters in the United States specializing exclusively in the production of secondary aluminum. Some manufacturers who are important consumers of aluminum have found it more profitable to install recovery plants than to sell their scrap to outside remelters. In the future the number of these small recovery plants will probably decrease as the complexity of aluminum scrap has been rapidly increasing. The large remelters have properly equipped laboratories and can therefore produce a much higher grade of secondary aluminum.

Raw material for the production of secondary aluminum varies greatly in composition, availability, grade, character, desirability, and price. This material is divided into two main classes: market scrap and process scrap. Market scrap is any kind of scrap available for purchase in the open market. Process scrap is scrap arising from the production of manufactured articles which is reused in the original plants.

All scrap is sorted and graded to increase the value and recovery in melting. The junkman sorts his scrap roughly, but the remelters must accurately classify the scrap before it is sent to the furnace. Various tests, either chemical or physical, are used in sorting to assist in the identification of material. Such tests as hardness, bending, color, and fracture are used. These tests and many others are used by the large remelters to determine the percentage of pure aluminum that is in the various alloys that are on the market today. Aluminum scrap and wastes are ordinarily given some preliminary treatment prior to furnacing. This treatment depends upon the classification of the scrap. Much of the scrap metal must be cleaned, dried, baled, ground, or screened.

In melting certain classes of aluminum scrap, the prevention or control of oxidation is one of the most important problems before the metallurgists. Clean heavy scrap may be melted like pig metal with minor oxidation loss, but serious losses may occur in melting light or finely divided scrap unless proper precautions are taken. High oxidation losses correspond to low recoveries in secondary aluminum practice. The normal loss due to oxidation in remelting the various classes of scrap in part determines the prices which are paid for these materials. Aluminum oxidizes readily in air at ordinary temperatures, but the rate of oxidation increases with the temperature, and in the liquid state it is extremely rapid. Various methods have been suggested, patented, and used in practice for preventing or reducing oxidation of aluminum scrap on melting. Briefly, these methods involve the exclusion of air and the promotion of coalecsence by chemical or mechanical means. In practice some combination of the various methods are used. A liquid-flux cover prevents contact of the hot furnace gases with the metal, and as a rule the fluxing cover is of such composition that it will have some solution effect upon aluminum oxide. The principal fluxes used in aluminum melting are comprised of metallic salts, chiefly alkali and alkaline-earth chlorides and fluorides. One patented flux is a mixture of sodium fluoride and zinc chloride.

Many types of furnaces have been used in practice for melting aluminum and aluminum alloy scrap and waste, and wide differences of opinion have been held as to the most suitable furnaces for this class of work. In the last few years there has been a definite trend toward standardization, particularly where tonnage is important, with the development of the stationary-hearth open flame furnace for aluminum

melting. Where certain scraps and wastes are melted in small lots, stationary iron pot and crucible furnaces are satisfactory.

The recoveries or yields obtained in melting aluminum scrap vary widely and depend mainly upon the general character and conditions of the materials. Considerably higher recoveries are obtained from clean, heavy scrap than from dirty and light material. Methods of pre-treatment, furnacing and fluxing, and skill of furnace hands are important factors in determining the yields obtained, more especially in the case of finely divided scrap. The recovery from untreated scrap is substantially less than cleaned or otherwise pretreated material. Recoveries range from 50% for grindings to 96% for clean castings.

The development of the secondary aluminum industry, both in the United States and abroad, has been brought about by economic necessity. It has been reared by the demand of consumers for metal at lower prices than the aluminum producers have seen fit to make. Secondary aluminum is available at three-fourths the price of primary aluminum.

Many misapprehensions have been and still are held by consumers of aluminum regarding the quality and possible utilization of pig metal made from aluminum scrap. Consumers generally have felt that secondary aluminum is always distinctly inferior to primary metal and that consequently it cannot be used for various purposes. The facts in the case are that secondary aluminum can be satisfactorily used for any purpose where primary metal is regularly employed. This means that secondary aluminum of the required composition, properly made and refined, is the metallurgical equivalent of primary aluminum in every respect.

MODERN ENGINEERS

by John E. Bartmess, m.e., '41

In this, the third issue of "Modern Engineers," Dr. Gustav Egloff is presented. This brief biography of Dr. Egloff, sometimes addressed as "Gasoline Gus," has been chosen for this page because of his work in the petroleum industry. Prof. E. F. Armstrong of London states, "Few men are more widely known or popular at gatherings of petroleum technologists than Gus Egloff . . ."

The contributing editor wishes to express his thanks to the Universal Oil Products Company of Chicago for the material used in this review.

DR. GUSTAV EGLOFF was born in New York City of parents who came to this country from Switzerland. After he had completed his high school education, he went to work in a mercantile establishment.

He had relatively little interest in higher education until he met the girl whom he later married. She awakened the desire for self-improvement, and as a result, her husband achieved the high position in chemical research which he now possesses.

Dr. Egloff attended Cornell University (1908-12) where he had obtained a competitive state scholarship. His interests in commercial photography helped pay his college expenses. He managed to study chemistry as well as keep an active interest in athletics, literature, sociology, the theater, and the opera. Dr. Egloff then entered Columbia University and there received his master of arts degree in 1913, and his doctor of philosophy degree in physical chemistry in 1915. At Columbia he was assistant to Professor T. B. Freas and was a Barnard Research Fellow in 1914 and 1915.

During World War I, Dr. Egloff was employed by the United States Bureau of Mines. Later he took the position of chief chemist for the Aetna Chemical Company which was located at Pittsburgh, Pennsylvania. Here his work consisted of cracking oils, both experimentally and commercially. At this time his life was saved by a habit that he detests—that of being late. He was late to observe a plant test on cracking. The test was an attempt of the company to develop one of the early types of cracking equipment; the equipment exploded and fatally burned four workers.

Dr. Egloff became Director of Research for Universal Oil Products Company in 1917 and has been with that company ever since. He has attended a number of International Conferences as a delegate and a speaker. He has been recognized by many national gas, petroleum, and mining organizations. In 1933 he was selected by the Columbia Broadcasting Company to give several broadcasts under the auspices of the Science News Service. In 1934 he delivered another radio broadcast at the request of the American Chemical Society.

Not only has Dr. Egloff made himself one of the most distinguished chemists and chemical engineers, but he has also greatly furthered the activities of various technical organizations. To list these organizations would take at least two full pages.

In recent years Dr. Egloff has had a place in the educational activities of the nation. He has taught and lectured at the University of Chicago, Columbia, Princeton, Northwestern, University of California, University of Southern California, Leland Stanford University, University of Missouri, University of Illinois, University of Michigan, New York University, Cornell, Purdue, M. I. T., and the University of Man-

chester, England.

He writes regularly of the "Cracking Art" for the Annual Reviews of Petroleum Technology. He was appointed through the board of directors of the American Institute of Mining and Metallurgical Engineers to act in an advisory capacity to the Museum of Science and Industry of Chicago. He prepared both the petroleum exhibit and the chemical exhibit for the Century of Progress Exposition at the Chicago Worlds Fair. The Century of Progress Comittee also requested him to prepare a book on petroleum. The book, *Earth Oil*, was published in March of 1933. Since that time he has published several books on petroleum hydrocarbons including a monograph for the American Chemical Society.

Dr. Egloff is the author of three hundred and seventy-five articles relating to his industry and to the chemistry of hydrocarbons. These articles all reflect his intense interest in the cracking and refining of oil and are among the most scholarly papers written on petroleum technology according to Dr. Charles S. Palmer of Pittsburgh.

Two hundred and forty patents have been issued to him in the United States and abroad. These are all related to the processing of petroleum, coal, shale oil, and chemical derivatives of hydrocarbons. He has made the oil cracking process a commercial actuality. Professor McKnight of the University of Texas has stated:

"The vitalizing feature of the Egloff invention is said to be the two coil scheme—the principal of 'selective cracking.' This principle has been of immense importance in the art, and to this patent, according to the court decision, is accorded the credit for teaching this principle to the world." With this and other inventions Dr. Egloff has saved both oil and money for the oil industry.

One of Dr. Egloff's associates makes a number of very interesting comments about him:

"Unquestionably he is keen and has wide interests and deep appreciation of his associates. He works hard, frequently without regard for hours, and travels great distances in search of information or to assist a friend. He turns out a large number of publications, some of them of considerable length. And still he is sometimes addressed as "Gasoline Gus."

"If he knows a subject at all, he seems to be ready on the spur of the moment to discuss it at length and in great detail. Once in an effort to disqualify him as an expert witness, an attorney of the opposition asked him to tell the court all he knew about emulsions or some such subject. It took six weeks of the courts' time for him to answer the question. It is not to be supposed that he could do this without studying and refreshing his memory between sessions of the court, but obviously in a case that was highly important to know, he could not afford to give the opposition any opportunity to point out from his testimony that his knowledge was limited."

He has played golf, but at the present time his hobbies are walking and working scientific problems of the petroleum industry. He is very enthusiastic and seems to possess an unlimited amount of energy. Everybody likes Dr. Egloff. His sense of humor, depth of human interest, and his highly retentive memory make it a delight to know him. In addition to having a great many worthwhile ideas of his own, he seems to have an uncanny ability to find them in others. One of his associates pays him as great a tribute as any person could desire when he describes him as, "a philosopher who is appreciative of fine arts, a pleasant associate, and a loyal friend."

Photo Courtesy Converse Studios, Inc.

Dr. Gustav Egloff, the TECHNIC'S Engineer of the Month.

Ch.E.'s Hear Dr. Egloff in Chicago

Almost the entire junior and senior membership of the Rose A.I.Ch.E. attended the Chemical Exposition held in Chicago December 11-15. The program of the exposition included lectures, motion pictures, and commercial and scientific exhibits. Dr. Egloff was heard Friday night, December thirteenth. His subject was "The Service of Chemistry to Industry." Many alumni were seen among the visitors. From the student chapter's standpoint the trip to the exposition was a great success as much of Chicago was seen in addition to the chemical exposition.

—H. L. M.

EDITORIAL SIDELIGHTS

Let There Be Light

There is a story, perhaps it is but myth, that every freshman is told before he is long in this institution of higher learning. That story's prime principle is to illustrate to the lowly freshman the length of the final examination with which he is likely to come in contact while at Rose. It also shows that even back in the ages before our time at school light did not come readily to either the student's mind or eye. That story, as I remember it, was told me by a fraternity brother something like this:

"We at school had just finished our sophomore year with the exception of the final in integral. It was one of those typical Terre Haute dark rainy days. We went to that exam and the hours dragged; two o'clock, three o'clock, four, and finally, as the hands on the clock in the drawing room turned to the hour five, each and everyone of us brought forth from our possessions a candle, propped it up on the desk, and lit it."

Today the drawing room has lights, beautiful mercury vapor ones. I had a quiz in that room the other day and they really are sweet. You can see what you are doing. I have been told that the machine design room has the same sort of lights, but, although I have seven hours a week in that room, I did not find them until a few minutes ago. Then it was that I discovered them, with the aid of a match and a diligent reconnaissance, in the back of the machine design office packed away very neatly in cardboard boxes.

The class rooms still have lights designed shortly after the gaslight period. In thermo this morning I noticed that one of the four lights was out. It was hard to tell which one it was when it was compared to the three that were lighted. In econ I could read my slide rule to but one significant figure. Perhaps, as a member of the senior class of the country's best engineering school, I should supplement this report with data listing the actual footcandles of light in each room. It seems, however, that the minimum light required may best be judged by the eye.

This report has tried to show three points:

1) We, the student body, are thankful for the new mercury vapor lights in the drawing room.

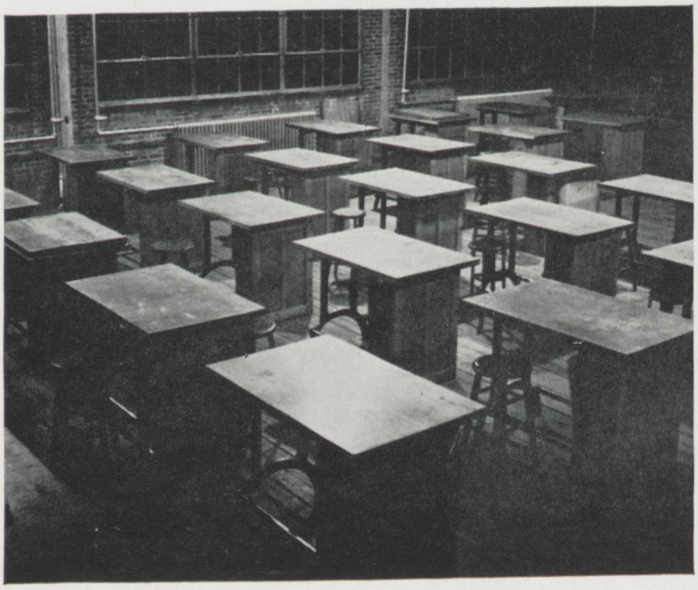
2) We request that the lights purchased for the machine design room be installed.

3) We believe that it would be advantageous to all to replace the burned-out light bulbs in the building, as well as those which still strive to send their glow through the class rooms, with larger lights.

—J. E. B.

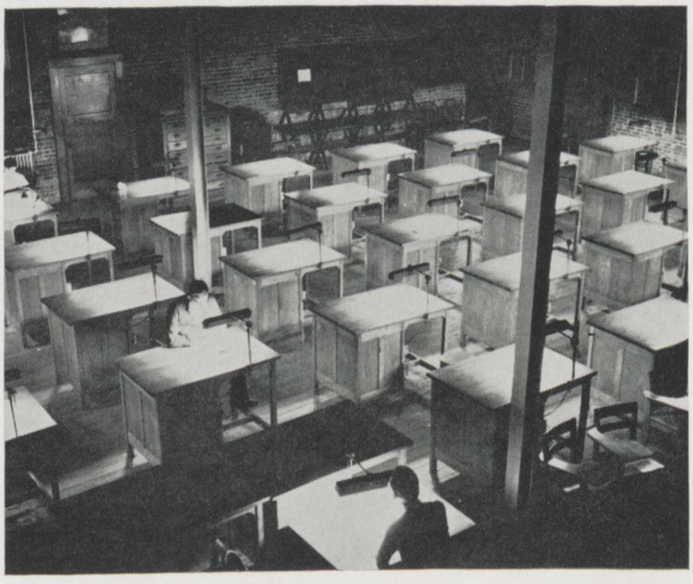
Defects In Our Engineering Educational System

Many of the criticisms which can be made in general of present-day technical education obviously do not apply equally to all institutions as there will naturally be found considerable diversity not only in the educational ideals of these institutions, but in the degree of practical application of such ideals. One of



THE DARK AGE

Gloom at its best is illustrated by the Machine Design room at Rose. The room, under full illumination, was photographed with the most sensitive film to be procured in Terre Haute.



TO THE LIGHT

The new fluorescent lamps in the drawing lab attract study groups nearly every night. Possibly an over-developed film; the glare is not as noticeable as pictured.

THE ROSE TECHNIC

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Faculty Advisers

JOHN L. BLOXSOME — HENRY C. GRAY

the most widespread faults in our educational system, however, is the indiscriminate admission of unqualified students to colleges and universities. This is evidenced by the high student mortality rates in almost all schools. The undesirability of such a status is obvious. The unfortunate students suffer from a loss of time and money, which deprives many of them of the opportunity to enter fields in which they are really qualified. The schools suffer as it lowers the standard of teaching and increases the cost of instruction.

Unfortunately, high school standings alone cannot be taken as sound criteria of the student's ability. Much can be done in the high schools, however, in attempting to correlate student abilities and vocations most suited to them. Vocational guidance courses in which the students are exposed to the requirements, working conditions, and remuneration of all types of occupation should be requisite. Such a course would include vocational analysis tests, I. Q. tests, and whenever possible, field trips for the purpose of obtaining first hand knowledge. Entrance examinations in all engineering schools whereby the extent of a student's natural analytical ability would be indicated would also help solve the problem.

This process of narrowing the students' spheres of interest and studies can be overdone, however, and this tendency exists in many of our engineering schools today. The trend toward specialization in undergraduate work to the injury of sound basic education is a serious problem. It is difficult to teach successfully current engineering practice in special fields to undergraduates. The newer arts and techniques are advancing so fast that by the time texts are printed, they are almost out of date. Thus, by the time the student has graduated and attained a responsible position in his chosen field, (at least several years), the methods and facts presented while at college are too often extinct and useless.

It also takes valuable time of the student which may be employed in obtaining a more thorough understanding of, and training in, the fundamentals of engineering and their broad, rather than specialized, applications. An overcrowded curriculum leads to superficiality rather than thoroughness, and thoroughness is a prime requisite of all successful engineers. Thoroughness, which includes and emphasizes understanding, should be the first objective of engineering training.

For all the time spent in specialization, probably ninety percent of the students do not follow the field in which they specialized when at college. Circumstances and opportunity for employment play the most important part in the ultimate selection. In other words, practically all the time and effort spent is for naught, except insofar as it may be useful training in application of fundamentals and thoroughness.

And then there is the matter of insufficient training in the logical approach to an engineering problem. Engineering schools seem to vie with each other in publicizing extensive curricula in which subject matter is stressed rather than training. The idea seems to be that the best college is the one which has the most elaborate and extensive curriculum, with special emphasis on laboratory courses. Having announced such a full program, the attempt to carry it out must be made. Here is where the mistake is made. The student is expected to learn more and more in a given time. The courses must be streamlined with short-cuts so that he can complete the work outlined in the curriculum. To obtain high or even passing grades, he is forced to memorize extensively—he cannot take time to think. Thus, the main purpose of engineering education, a thorough understanding of basic fundamentals and training in their logical use are defeated. And as W. H. Carrier of the Carrier Corporation says, "Employers do not want human slide rules or walking encyclopedias of engineering knowledge. They want graduates trained in logical thinking, in habits of thoroughness, and in the scientific method of approach." —E. B.

RESEARCH AND DEVELOPMENT

edited by Alan W. Ker, m.e., '43

Trend of Aircraft Design

Recently the U. S. Navy tested the Grumman "Skyrocket", an all-metal, single-seat, pursuit ship powered with two 1,200 horsepower air-cooled Wright engines. One of the outstanding features of this ship is that the two Curtiss, electric, full-feathering propellers rotate in opposite directions. This ship which has been released for export has a long range operating radius and an estimated top speed of 450 miles per hour at 16,000 feet.

The Skyrocket can easily outmaneuver any single-motored pursuit ship because of its light weight of only 9,000 pounds and its excess power. With only seventy per cent of the power of one engine, the airplane can maintain a speed of 250 miles per hour.

One of the most important limitations of high speed flying for the future will be the "compressibility effect" of air at speeds approaching the velocity of sound—760 miles per hour. At these high speeds air has a tendency to break away from the wing surface and form bubbles which cause an enormous drag.

In wind tunnel research tests air speeds of 2,000 miles per hour have been reached. At these super-high speeds aerodynamic characteristics undergo a complete change, and the air gets in a condition of turmoil. These tests showed that speeds approaching the velocity of sound can be reached through careful streamlining plus the reduction of wing and fuselage areas and the use of flaps to delay the bubble point effect.

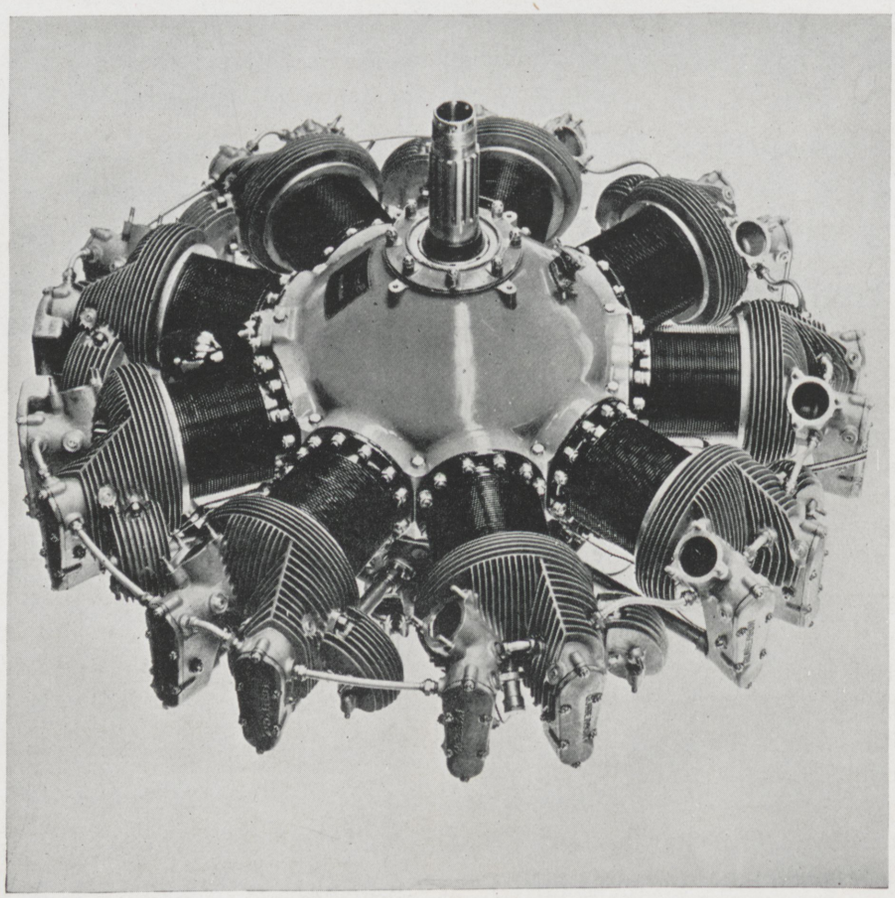
The horizon of research has now been extended to the study of the substratosphere. New ideas of testing are being employed in wind tunnels that assimilate the conditions of density, temperature, and pressure of high altitudes.

The substratosphere will be used for the high speed airplanes of tomorrow. The Grumman Skyrocket with a top speed of 450 miles per hour at 16,000 feet would have a much higher speed if it were able to operate efficiently at higher altitudes.

Army Tank Engines

Several months ago the Buda Company placed in production the Guiberson Aircraft Diesel engines. These engines are of standard air-cooled, radial design and develop 310 horse-power at 2400 revolutions per minute. When equipped with a supercharger, it is estimated they will develop 500 horsepower and have a total weight of about 700 pounds. The lightness gives them a specific weight of only 1.40 pounds per brake horsepower as compared with 1.44 pounds per brake horsepower for a 600 horsepower Pratt & Whitney Wasp and 1.28 pounds per brake horsepower for an Allison engine of 1000 horsepower. The outstanding advantage of the Guiberson Diesel engine is its low fuel consumption of .38 pounds per horsepower hour. The average gasoline aircraft engine's fuel consumption is almost .50 pounds.

These Guiberson Diesel engines made by the Buda Company have been adapted for tank use. They are equipped with a special fan, shrouding, and baffles to ensure efficient



Courtesy Product Engineering

NEW RADIAL MOTOR FOR ARMY TANKS
The new Guiberson Aircraft Diesel engine develops 310 horsepower at 2400 revolutions per minute.

cooling during long periods of operation in the comparatively small tank compartments. In the tanks the engines develop a minimum of 250 horsepower at 2200 revolutions per minute.

The successful performance of these engines in tanks has caused the Army to increase their past orders so that now these engines are in mass production. The tank engines are assembled with the same care that is given the aircraft engines and after assembly are given the same stringent tests. After a running-in test of five hours has been made, the engines are completely disassembled and inspected for wear and unsatisfactory performance. After reassembly the engines are tested for horsepower, oil consumption, and fuel consumption.

Forge Welding

The Progress Welder Company has developed a new process known as "forge welding" for spot-welding heavy sections. This process permits spot-welding of one inch thick iron and steel parts which were previously considered impossible to weld with conventional equipment.

The principle used is that of ordinary forge welding, known for centuries: however, the new process is very rapid. A pressure of about 2000 pounds is applied to the work and an interrupted current is used to heat the metal after which a hammering action of an additional 1000 pounds forges the weld.

A "Hydro-Booster" mounted on the upper arm of the spot-welder is used to hold and hammer the metal. The booster consists of two chambers, one above the other, both receiving compressed air from a ninety pound factory line. The lower piston supplies the initial 2000 pounds pressure for holding the work while the upper piston working independently superimposes rapid hammer blows of approximately 1000 pounds per blow. The combination of interrupted heat with intermittent hammering completes the welding operation.

This type welder is available in different sizes and with optional equipment. For production work, a timer is available for accurately controlling the sequence of operations just as in spot-welding. A small unit for portable spot-welding guns has been designed that will handle work up to one half of an inch thick.

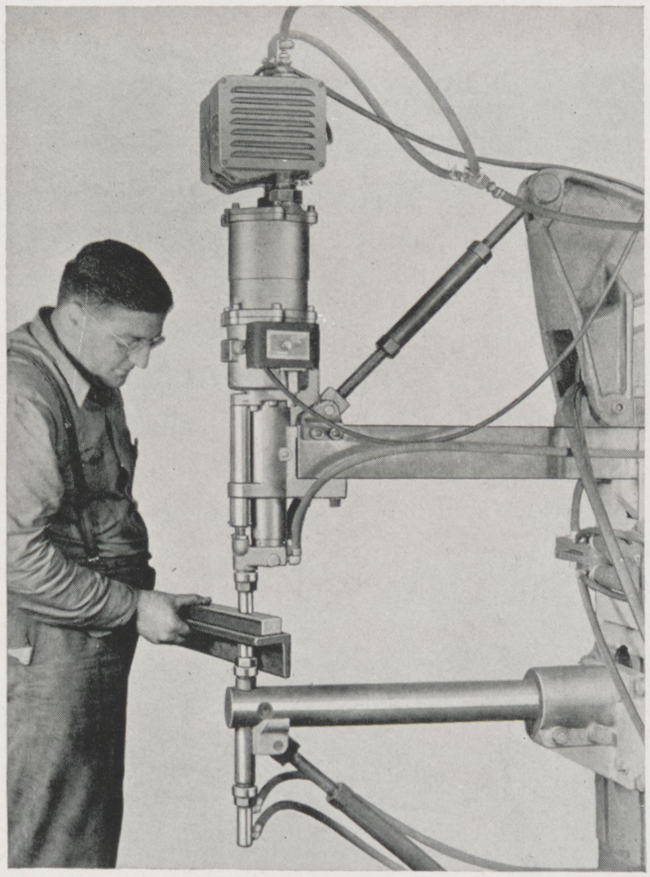
Chronoscope

The chronoscope is a self-contained, portable, electronic interval timer developed for testing the velocity of rifle bullets. This device measures intervals between one millisecond and two hundred milliseconds (.001 to .200 seconds) on five different ranges with an accuracy within one percent of full scale.

The principle of operation of the chronoscope is very old and simple; however, it has been brought up to date by the use of modern tubes and circuit applications. It consists merely of passing a known current through a ballistic galvanometer for the length of time to be measured. The time interval is determined by the amount of swing of the galvanometer pointer, since the maximum deflection is directly proportional to the time interval.

The galvanometer used in the chronoscope is equipped with an illuminated dial and special pointer to facilitate reading of the swing. It has a period of approximately five seconds. The galvanometer current is supplied by self-contained batteries, and the switching operation is performed electronically. A thyratron type of switching circuit has been employed instead of the conventional plate to plate capacity-coupled circuit for two reasons. First, the current flowing through the galvanometer can be adjusted and set at a steady rate without regard to transient current. Secondly, the circuit locks out after the galvanometer current has been cut so that subsequent impulses can not affect the switching tubes.

To check the operation of the chronoscope, calibrations at both ends of each range are made by means of oscillograph records using a frequency standard as the time reference. After the condition of the batteries has been checked by built-in instruments and the ballistic constant of the meter has been checked by the condenser-discharge method, the filaments of the tubes are energized and the galvanometer current set at a steady rate. When these three points have been checked, there is always full assurance of the accuracy of the results that are obtained.



HEAVIER WELDS WITH NEW SPOT WELDER *Courtesy Machinery*
Welding by a combination of interrupted heat and intermittent hammering with the new forge welder.

AROUND THE CAMPUS

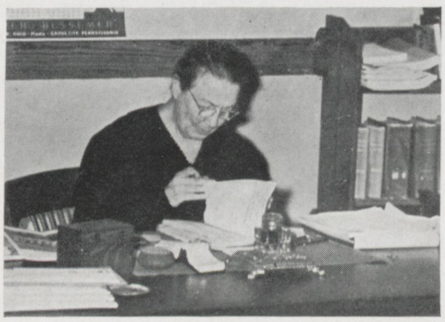
with John T. Newlin, c.e., '43

Faculty Members Active

Various members of the faculty have been busy lately attending conventions and fulfilling speaking engagements. Some of their recent activities are noted below.

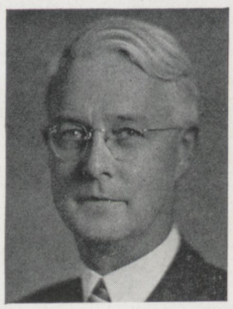
Registrar

Miss Mary Gilbert, registrar; Dr. Donald Prentice, president of Rose Polytechnic Institute; and John M. Phelps, admissions counselor, at-



tended the annual meeting of the Association of Indiana College Registrars at Purdue University, November 7.

Dr. Prentice



Dr. Prentice also attended the meeting of the Society for the Promotion of Engineering Education of which he is president. The meeting was held in Chicago, November 11 and 12, in conjunction with the Association of Land Grant Colleges and Universities.

Irvin P. Hooper

Irvin P. Hooper, new instructor in mechanical engineering at Rose, has been conducting a night class in machine design at Dugger, Indiana. These classes are held each Friday night from seven to ten in the Cass High School building in Dugger in conjunction with the State Trade Extension Course program in Indiana. They are attended by a group of about 15 strip-mine workers and other local workmen who are interested in extra training and instruction in designing modern and efficient machinery.

Professor Knipmeyer

Professor Knipmeyer, head of the electrical department, attended the National Council of State Boards of Engineering Examiners at Charleston, S. C. At the meeting he was elected vice-president of the council. Professor Knipmeyer's association with engineering examiners boards is gaining him quite a reputation. At the annual meeting of the Engineers of Indiana at Fort Wayne he spoke on engineering registration. He is also vice-chairman of the Indiana State Board of Registration for Professional Engineers.

R.O.T.C. Promotions Announced

The following promotions were announced by order of Captain Henney, November 28:

To Cadet First Lieutenant: John G. Appel, John E. Bartmess, Harry R. Buell, William M. Hales Jr., Edward J. Klecka, and William D. Schwab.

To Cadet Staff Sergeants: Harold E. Bowsher, James R. Brown, Marion B. Foley, Jack K. Kennedy, Leon L. O'Dell, Benjamin K. Sollars, and Eldon M. Sutphin.

The R.O.T.C. unit at Rose consists of a battalion of engineers. Members of the unit wear a blue star on the sleeve of their uniform emblematic of the grade of "excellent" awarded at the inspection held last spring. Besides class work in military science and tactics the R. O. T. C. students hold drill every Monday from 3:40 to 4:40.

The following cadet first class privates have been promoted to cadet corporals: George C. Blakey, Carl D. Peterson, Robert R. Pease, Roy R. Baker Jr., Robert W. Mitchell, Wayne C. Shanks, Joseph Pipp, Alan W. Ker, Victor W. Tatelman, Howard H. Irvin, Victor C. Utterback.

Radio Club Sponsors Code Practice

The Rose Tech Radio Club met for the second time this year, Thursday, October 17, for the election of club officers, nominations having been made at the first meeting. John E. Tracy, Rolland H. Buell, and Joseph E. Dreher were elected to the offices of president, vice-president, and traffic manager, respectively. A governing board composed of George R. Schull and Arthur M. Wood was also selected.

The club, whose members own and operate the 250-watt amateur radio station, W9NAA, located on the Rose campus, began a series of radio code lessons November 18 for amateur radio operators in the midwest who are interested in learning radio telegraphy. These lessons were given each weekday evening, Monday through Friday inclusive, for one hour, 6:30 to 7:30 P. M., and will continue until about December 18. Station W9NAA operates at a frequency of 1875 kilocycles. The first part of each lesson is sent slowly for the benefit of beginners.

Under the direction of Herman A.

Moench, assistant professor of electrical engineering at Rose, the club has also sponsored a series of radio code lessons for the benefit of the students of Rose who are interested. These sessions of code instruction in sending and copying are held each weekday from 12:25 to 12:45 P. M. The primary object of these lessons is to qualify those participating for a class C operator's license.

Campus Improvements

The opening of each school year finds several new additions or improvements available in the main building on the Rose Tech Campus, and this year has been no exception.

The new fluorescent lamps which are now in use in the drawing room probably head the list of this year's improvements. Each desk is now individually lighted, and shadows have become a thing of the past. Lighting facilities here can now be compared favorably with any in the country. Anyone who has worked in this room on a dark afternoon in the past will applaud this as one of the biggest improvements in years.

The appearance of the campus at night has been greatly improved by the addition of a battery of floodlights focused on the front of the building. These lights, which were installed last June, have brought many favorable comments from both students and outsiders.

Excavation of the basement under the Mechanical Engineering laboratory this summer has doubled the available floor space in this department which has been overcrowded for years.

Another less apparent improvement, whose importance will be recognized by few, is the new roof which now keeps the interior of the main building dry. The entire roof was resurfaced during the summer, and protection from wind, rain, and storm is now guaranteed for several years to come.

Camera Club

This year the Camera Club is operating on a new basis. Since the revision of the Student Fund by the Student Council last year the Club has found that it is no longer necessary to charge the members dues. A change has also been made in the furnishing of supplies to the members, i. e., chemicals and papers. The Club no longer furnishes mixed solutions for the members. The dry chemicals are kept on hand and sold to the members in this form.

Not only has this system been a saving to the fellows in the Club, but the Club has been able to buy a new enlarger. The enlarger is of 2¼ x 3¼ size, and has a Zeiss Tessar f4.5 lens. A new enlarging easel has also been purchased.

Rifle Club

The Rifle Club is looking forward to a very successful year. The officers for this year are Charles Howlett, president; William Leedy, vice president; and Alan Ker, secretary.

At the first meeting plans were completed for opening the indoor range early for practice before this year's matches start. Thomas Lane, the club manager, has arranged several postal matches. One is with the University of Southern California.

There are six letter men on the rifle team this year, and the prospects for having a good small-bore team are very encouraging. Lieutenant Bennett is the Rifle Club sponsor.

Most of the rifle team members fired this fall on the outdoor range under sponsorship of the military department. The military department offered marksman, sharpshooter, and expert medals for those who fired the .30 caliber matches and were qualified to receive awards. The positions of the match were slow fire; prone, sitting, kneeling, and standing, and rapid fire; standing to sitting and standing to kneeling.

The following awards were made:

Expert Rifleman:

Victor W. Tatelman

The Alma Mater as seen with the new floodlights, the gift of the Class of '39.

Photo by Martin

"DANCIN' WITH ANSON" AT THE MILITARY BALL

Largest crowd in several years attended Tau Nu Tau's Military Ball to hear Ansow Weeks and his orchestra play a most successful dance.

Sharpshooter:

Alan W. Ker and John W. Anderson

Marksman:

Marion B. Foley, George A. Boesel, Thomas F. Lane, Von G. Geckler, Robert R. Pease, Jack K. Kennedy, Eldon M. Sutphin, Lloyd Buckhalter, Benjamin K. Sollars, Richard O. Driskell, Frank Jones, James S. March, Leon L. O'Dell, and Wayne L. Loving.

Military Ball Outstanding Success

Romantic music, lovely ladies, dashing uniforms, and a resplendent atmosphere all combined to make the 1940 Rose Military Ball an outstanding success. The romantic music was masterfully provided by Anson Week's orchestra, and the lovely ladies were made more lovely by their graceful formals and colorful corsages.

The ball, sponsored by the Rose chapter of the Tau Nu Tau military fraternity, was held December 7, from nine to one, in the Mayflower Room of the Terre Haute House. A banquet for the members of Tau Nu Tau and their girl friends was held from eight to nine.

The honored guests for the ball were: Dr. and Mrs. Paul Bogart, Dr. and Mrs. Donald Prentice, Col. and Mrs. Benjamin Wimer, Captain Frederic Henney, Lieutenant and Mrs. Paul Bennett, and Mr. and Mrs. Carl Wischmeyer. Chaperons for the evening were Mr. and Mrs. Hutchins and Mr. and Mrs. Knipmeyer.

As the couples who attended the Military Ball entered the room, they were presented to the honor guests, the chaperons, and the officers of the fraternity who formed a receiving line. The officers of Tau Nu Tau are William Hales, Quentin Jeffries, William Schwab, and Robert Phelps.

Radio station WBOW broadcast the music from the Mayflower Room from 9:30 to 10:00.

The members of Tau Nu Tau and their guests for the evening were: Mr. and Mrs. William H. Hales; Mr. and Mrs. J. Arnold Jones; Mr. and Mrs. Eldon M. Sutphin; Mary Jane Hunter, John G. Appel; Kay Trout, Joseph W. Dreher; Jennie Nelson, James E. Shake; Dorothy Stirwalt, John R. Roberts; Wanda Yaeger, Quentin R. Jeffries; Helen Cooprider, Charles A. Howlett; Jean E. Johnston, John E. Bartmess; Helen Hirt, John L. Combs; Anne Conway, George C. Harper; Clare Ely, Edward J. Klecka; Carolyn Parker, Robert D. Phelps; Harriet Price, John E. Tracy; Nina Howlett, Robert Ringo; Kay Conover, George R. Schull; Joan Short, Clay Riley; Betty Keator, Fred Wehle; Alice Wilson, William D. Schwab; Betty Gemmecke, Donald Logsdon; Martha Barnett, Harold Bowsher; Francis Haslem, James R. Brown; Mary Helen Lyons, A. John Ullrich; Virginia Asbury, Fred Nahm; Millicent Martin, R. King Chalfant; Betty Howells, Marion B. Foley; Barbara Davis, Jack K. Kennedy; Jane Newson, Leon L. O'Dell; Dolly McCullough, William M. Hochstetler; and Marjorie Creal, Clifford Roberts.

RECEIVING LINE *Photo by Martin*

Officers of Tau Nu Tau and the Honor Guests at the Military Ball, were: reading left to right, front row: Mrs. Carl Wischmeyer, Mrs. C. C. Knipmeyer, Mrs. Donald B. Prentice, Mrs. William Hales Jr., Miss Mary Gilbert and Miss Kathryn Dibble. Back row: Quentin R. Jeffries, Miss Wanda Yeager, Col. Benjamin Wimer, Prof. Carl Wischmeyer, Major C. C. Knipmeyer, Dr. Donald B. Prentice, Lieut. Paul D. Bennett, William M. Hales Jr., Mrs. R. E. Hutchins, Mrs. Paul D. Bennett, Mrs. Benjamin E. Wimer, Capt. Frederic A. Henney, Capt. R. E. Hutchins, Miss Alice Wilson, William D. Schwab, Miss Carolyn Parker and Robert D. Phelps.

ALONG WITH THE SPORTS

edited by Michael W. Percopo, ch.e., '43

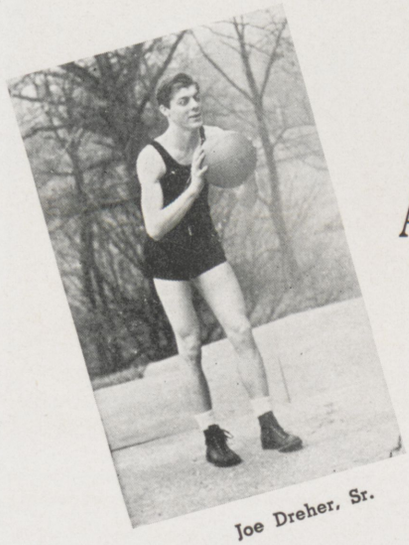
Football Lettermen Announced

The following men were awarded the varsity letter and sweater in football for the year 1940:

George Harper, Captain, Sr.
John Combs, Sr.
Raymond Hogan, Sr.
Roger Howle, Sr.
Albert Klatte, Sr.
Harold Bowsher, Jr.
James Brown, Jr.
Martin Cavanaugh, Jr.
Charles Muerer, Jr.
Earl Michaels, Jr.
Carl Miller, So.
George Mitchell, So.
Robert Mitchell, So.
Joseph O'Connell, So.
William Rumbley, So.
Donald Sweeney, So.
Jack Warwick, So.
William Bubeck, Fr.
George Cornelius, Fr.
William Morris, Fr.
Charles Van Meter, Fr.
Joseph Van Meter, Fr.
Joseph Walters, Fr.
Edward Klecka, Senior Manager.

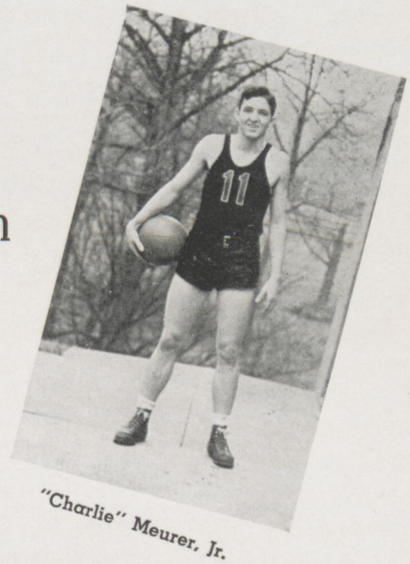
The backbone of any football team is the group of unsung heroes who come to football practice every day regardless of whether or not they get to play on Saturdays. These are the boys who really love the game and perhaps next year they too will be the headliners. It takes a lot of spirit to go to practice day after day, and know that you are not going to be awarded a letter, so let's give the following men a rousing cheer for their loyalty and wish them the best of luck for next year.

Fred Nahm, Jr.
Richard Holthaus, So.
Harmon Rose, So.
Wilbur Sellers, So.
Mark Downing, Fr.
Richard Ellsworth, Fr.
Claude Hershey, Fr.
Kenneth Allison, Fr.
Ray Hoppenrath, Fr.
Managers:
John VanderVeer, Jr.
Lydon Eberly, So.
Robert Pettit, Fr.
Christy Jones, Fr.



Joe Dreher, Sr.

It's Here Again



"Charlie" Meurer, Jr.

Basketball starts again with Joe Dreher and Charlie Meurer co-captaining the Rose team for the 1940-41 season.

Rose Basketball Schedule for 1940-1941

December 4—At **DePauw University,** Greencastle, Ind.
December 7—At **Earlham College,** Richmond, Ind.
January 10—At **Wabash College**, Crawfordsville, Ind.
January 14—At **Oakland City College,** Oakland City, Ind.
January 17—**Joliet College,** here.
January 22—At **Shurtleff,** Alton, Ill.
January 25—**Aurora College,** here.
February 7—At **Aurora College,** Aurora, Ill.
February 8—At **Joliet College,** Joliet, Ill.
February 13—**Wabash College,** here.
February 18—**Oakland City College,** here.
February 22—**Shurtleff College**, here.
February 24—**Earlham College,** here.

Rose Places Second in Indiana Conference

The "Fighting Engineers", winning four of five Indiana Conference games, finished in a tie for second place dividing honors with the "Purple Aces" of Evansville College. Manchester College and Butler University shared honors for first place.

The Engineers got off to a fast start in the race by defeating Wabash, their traditional rival, for the first time in 23 years. In their

second Conference game, the Poly men met defeat at the hands of Evansville College. After a week's layoff, accompanied by Phil Brown's polishing, the Engineers came back to win their three remaining Conference contests in no uncertain fashion.

In non-conference games, the Engineers lost to Cape Gireadeau Teachers of Cape Gireadeau, Mo., and Austin Peay Normal. Milton College of Wisconsin suffered a thrashing defeat at the hands of the Engineers.

The totals for the year show 5 wins and 3 defeats, which is not bad ball playing in any league. The Engineers scored 163 points against the opposition's 58 points.

Rose Grid Men Honored on All Star Elevens

As the football season comes to an end and conscientious football players draw puffs on pipes and cigarettes for the first time in several months, rival football coaches, officials, and sportswriters gather to decide who was who in the gridiron battles of the past season.

The "Fighting Engineers" placed at least one man on every team selected.

Following is a list of the Rose men represented on the different All Star elevens chosen by experts:

The All-Indiana Asociated Press Conference Team

First Team—Al Klatte, F. B.

Second Team—Earl Michaels, Q.B.
Hal Bowsher, H. B.
Wm. Rumbley, E.

The Indianapolis Star's All Conference Eleven

First Team—Hal Bowsher, H.B.

Second Team—Bill Rumbley, E.
Al Klatte, F.B.

The Indianapolis News' All Star Team

First Team—Earl Michaels, Q.B.

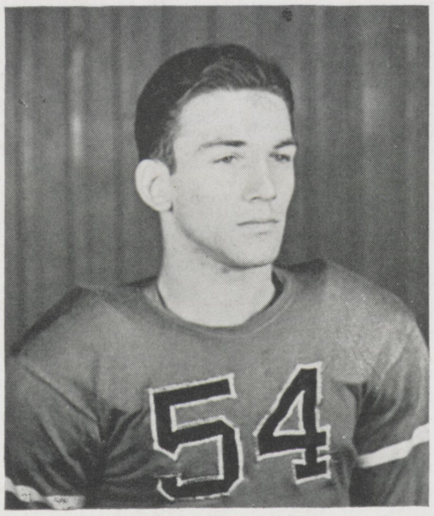
Second Team—Hal Bowsher, H.B.

Third Team—Al Klatte, F.B.

The Coaches All Conference Football Team

Second Team—Earl Michaels, Q.B.

Honorable Mention—Al Klatte, F.B. and Ray Hogan, T.



"Slinging Sammy" Michaels, the Indianapolis News selection for All-State quarterback.

Rose Downs Milton 38 to 0

The nation may have been celebrating Armistice Day, but Milton College of Wisconsin certainly did not find the Rose Poly "Fighting Engineers" very peaceful in their gridiron battle on that day. Despite a raging wind accompanied by intervals of heavy rain, the Engineers highly polished scoring machine went into action to defeat Milton 38 to 0.

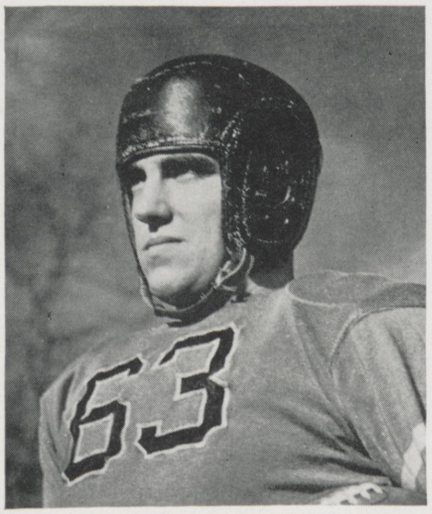
The stands were filled to capacity for the first half, but the storm reached such a ferocious temper in the second half that the loyal fans had to abandon their seats to seek refuge in their cars.

Klatte started the ball rolling for the Engineers late in the first period when he intercepted a Milton pass on their 38 yard line. Until then, the first period had been nothing but a nip and tuck affair. On the next two plays Bowsher and Meurer collected 10 yards to put the ball on Milton's 28 yard line just as the first period came to a close. On the first play in the second quarter Jim Brown skirted through tackle for 24 yards to put the ball on the 4 yard stripe. Joe O'Connell caught one from Michaels to score the opening touchdown of the game. Hogan's conversion went haywire in the strong wind.

The Milton aggregation retaliated with a passing and running attack which brought them to the Rose 12 yard line only to lose the ball on downs. Milton returned a Rose punt to their own 32. Michaels intercepted a pass from Bladorn and ran 24 yards before he was brought down on the Milton 26. On the next play he picked up 16 more yards on a fake pass and then followed up with a touchdown pass over the center to Ellsworth. The wind was too much for Hogan's try for the extra point. The scoreboard at the end of the half read Rose 12, Milton 0.

Between halves the Military Department put on a Military review for the fans. Although the boys found it hard to march and to keep their hats on at the same time; they came through with flying colors.

Hardly had the fans settled down for the second half, when Earl Michaels received the opening kick-off and jackrabbited 80 yards behind some swell blocking to score the first of two touchdowns in the third period. A blocked kick on Milton's 21 yard line was carried by the wind to the Badger's 2 yard stripe to set the stage for the second touchdown. Instead of kicking against a strong wind, Michaels passed to Rumbley for the conver-



High-scoring Al Klatte ranked first in the Indiana Conference with a scoring record for the season of 60 points.

sion, making the score 25 to 0.

Rose scored twice again in the final quarter. Roger Howle and George Mitchell turned on the steam and were responsible for the first score. Mitchell went over from the one yard line and Charlie Van Meter converted. Charlie Meurer set the stage for the final touchdown by intercepting a pass on Milton's 22 yard line. Al Klatte plunged through the line several times finally going over the goal line. Michaels passed to Sweeney for the extra point.

Rose Wins Over Hanover 24-0

Playing for the second time in the same week, the Rose Poly Engineers defeated the Hilltoppers of Hanover College 24 to 0, winning their fourth Indiana Conference game, consequently tieing for second place honors with Evansville College.

Earl Michaels really went to town in this game. His mighty right arm accounted for 11 completions out of 14 attempted passes in the first half. The passing combination of Michaels and Bowsher proved too much for Hanover. Altogether Rose attempted 21 aerials and completed 14.

Michaels got underway early in the first period completing a pass to Bowsher from Hanover's 45 yard line for a first down on the Hilltopper's 20. Hanover, however, got back to midfield after recovering Michael's fumble. "Mike" lost no time in redeeming himself. He intercepted a Hanover pass and ran it back to the Hilltoppers's 22 yard line. Michaels than rifled a pass to Bowsher on the 7 yard line making it first down and goal to go. Bowsher carrying the ball on the next two plays advanced it to the 1 yard line from where Klatte went over for the touchdown. This was Klatte's ninth touchdown in four games and it put him in a tie for first place in the state's scoring race. Morris's attempted conversion was no good.

The second quarter opened with Klatte receiving a Hanover punt and returning it to the Hilltoppers's 45 yard line. Michaels pitched a long pass to Brown, who made a sensational shoe string catch on Hanover's 20. Michaels on a fake pass went through the center of the line for 8 yards and then passed to Roger Howle on the 5 yard line. After a line plunge by Michaels, Klatte went over to score another six pointer, this time his tenth of the year putting him in first place among the state's scorers. Morris's conversion failed.

The Hilltoppers threatened to score at this time letting loose with a powerful running attack which brought them inside Poly's 15 yard line. The Rose defense stiffened and a would be Hanover passer was caught behind the line of scrimmage on the fourth down. This marked the only instance the Hilltoppers got within striking distance of pay dirt.

Co-captains for '41 Grid Team

Harold Bowsher, of Terre Haute, and Earl Michaels of Riverside, Ill., halfback and quarterback respectively, were elected co-captains of the Rose 1941 football team. These two men will succeed George Harper, retiring football captain, who is graduating this year. Both are juniors.

Al Klatte on a fake punt formation ran the ball 35 yards to midfield to get things started for another potential touchdown. However, after Michaels had completed three passes to Howle the Engineers lost the ball on downs on Hanover's 10 yard stripe. The half soon ended with Rose on top 12 to 0.

In the second half, Rumbley received the opening kick-off which he returned to his own 34. The next play was really a thriller. Michaels flipped a pass to Rumbley who ran to midfield and then lateraled to Jim Brown who in turn scooted for 50 yards to make the score 18 to 0. The last touchdown of the game was also scored in this quarter. Hanover punted to Klatte on the Rose 32. Michaels slipped past 280 lb. Don Smith at left tackle for 28 yards to Hanover's 40. Brown ran for 10 more and Red Sweeney, on an end around, picked up 15 more yards. After two unsuccessful attempts to go through the line, Michaels passed to Rumbley for the touchdown. Hogan failed to convert for the extra point.

Rose put on another touchdown march in the last frame, reaching the Hilltoppers's 2 yard line. Klatte bucked the line to get across to pay dirt but Rose was offside on the play. Michaels, on the last down, was caught behind the line of scrimmage.

Engineers Close Season Losing to Austin Peay 14 to 7

The Engineers traveled on November 23 to Clarksville, Tennessee, deep in the traditional South, to engage a tough Austin Peay Normal eleven in their closing combat of the season. The Engineers came from behind to tie the score in the second period and threatened to score again but they lost the game when the Governors pushed the winning touchdown over in the third period.

The weather conditions and the muddy field prevented the Engineers from uncorking their snappy passing attack. Their lone score, however, was the result of a 37 yard pass from Earl Michaels to Don Sweeney. Ray Hogan converted for the extra point.

The Governors scored their initial touchdown in the opening period after they had intercepted a pass on the Rose 45 yard stripe. Allan Harvey, Normal fullback, passed a long one to Reedy Sears for the touchdown. McWhirter converted for the extra point.

The Governors pushed their winning touchdown over in the third frame as a result of a 60 yard touchdown march. Caraway, after two unsuccessful attempts, crossed the "Yankee" goal line from the 3 yard line. McWhirter's boot for the extra point was good, making the score 14 to 7.

This was the first meeting between the two schools. Austin Peay will travel north next year to engage the Engineers on the Rose field.

GRADE A GRADS

edited by Gene F. McConnell, m.e., '42

Grad of the Month

The spotlight is focused for this month's grad on the class of 1893, and narrowing the field a little farther, on Mr. William H. Waite.

In Mr. Waite's own words, his boyhood consisted of "just high school and a general good time." For his higher education he entered Rose in 1889 and was graduated with a B.S. degree in electrical engineering in 1893. Since that time he has been chief engineer of the Vulcan Steam Shovel Co. of Toledo, Ohio; chief engineer of the National Drill and Mfg. Co. of Barbarton, Ohio; and sales engineer and sales manager of the Browning Crane and Shovel Co. of Cleveland, Ohio, being employed in the latter position at the present time. Mr. Waite married Katharine Wiley of Terre Haute in 1898, and they have one son, William Wiley, who is the supervisor of personnel and instruction of the New Jersey Bell Telephone Co.

His hobbies tend to be directed toward his chosen field and are earth-handling and material-moving machinery. Along with many other persons, he considers chemical engineering to be a rapidly rising field. If so inclined, Mr. Waite advises young men to study engineering and especially the afore-mentioned branch.

Departed

Goldsborough Robinson died on November 18, 1940, from injuries suffered in a fall. He was a public accountant and engineer in Louisville, having been graduated from Rose in 1918 with a B.S. degree in electrical engineering and as the Heminway medal man of his class. Mr. Robinson is survived by a daughter, Catherine.

The Class of 1940

The group of men graduated last spring have now shouldered responsibilities and gone to work. Since several inquiries have been made as to just what they are doing, the latest available information about them is contained in the following:

William Adair, Flying Cadet, U. S. Air Corps, Maxwell Field, Alabama; Maurice Cannon, General Electric Co., Schenectady, N. Y.; Emil Christiansen, The Lunkenheimer Co., Cincinnati, Ohio; Robert Colwell, Illinois-Bell Telephone Co., Chicago, Illinois; Stanley Craig, The DeLaval Steam Turbine Co., Trenton, N. J.; Norman Eder, General Electric Co., Schenectady, N. Y.; Maurice Fleming, Lt., Armored Force School, Ft. Knox, Kentucky; Richard Hardman, Indiana State Highway Dept., Indianapolis, Indiana; John Heltsley, The J. P. Devine Co., Mt. Vernon, Illinois; Milton Hosack, The Link Belt Co., Indianapolis, Indiana; David Huggins, The Erie Railroad, Marion, Ohio; Maurice Johns, The Allison Engineering Co., Indianapolis, Indiana; Avery Kelsall, Public Service Company of Indiana, Kokomo, Indiana; John Kowinski, The Ice Cream Container Co., Chicago, Illinois; Willard Louthen, graduate student, University of Chicago, Chicago, Illinois; Willis Lucas, Indiana State Highway Dept., Indianapolis, Indiana; Max Mitchell, Northern Indiana Power Co., Clinton, Indiana; Chancellor Montgomery, Delco-Brake Division of General Motors, Dayton, Ohio; Richard Mullins, Ashland Oil & Refining Co., Ashland, Kentucky; Frank Pearce, graduate student, Massachusetts Institute of Technology, Boston, Mass.; John Quinn, Delco-Brake Division of General Motors, Dayton, Ohio; Robert Ripple, Indiana State Highway Dept., Indianapolis, Indiana; Nick Smilanic, The Sunbeam Electric Co., Evansville, Indiana; Earl Swickard, The Joseph E. Seagrams & Sons Co., Lawrenceburg, Indiana; Edward Taylor, The Standard Oil Co., Chicago, Illinois; Frederick Thodal, The Pratt-Whitney Co., Springfield, Mass.; George West, Curt J. Joa, Inc., Sheboyagan Falls, Wisconsin; Vernon Whitehouse, Indiana State Highway Dept., Indianapolis, Indiana; Clarence Wilkinson, Indianapolis Power & Light Co., Indianapolis, Indiana; Allen Wilson, The Sunbeam Electric Co., Evansville, Indiana; Walter Zehnder, The National Starch Co., Indianapolis, Indiana.

The Grads Advance

'08 George H. Freers formerly plant engineer and chief engineer at the Holcomb and Hoke Mfg. Co. in Indianapolis, has joined the engineering staff of the Marmon-Herrington Co. of the same city.

'11 Kenton R. Gharst is assistant engineer in the office of the Constructing Quartermaster at Ft. Benjamin Harrison.

'22 William E. Danner, formerly president of the Danner Dry Goods Co., is electrical engineer with the Commercial Solvents Corporation in Terre Haute.

'27 Edwin S. Booth, who previously practiced patent law in South Bend, has moved to Chicago.

'29 Clarence L. Muntz, with the U. S. Geological Survey, has been transferred to University, Louisiana.

Some 21,500 cars and trucks are in regular day to day service with the Bell System. The great majority have bodies specially developed by telephone engineers. Many are equipped with power winches, air compressors and pole derricks. Each of the many types is designed to handle particular functions in the construction and maintenance of telephone plant.

Planning, purchasing and operating the world's largest fleet of commercial motor vehicles is a big job in itself.

Yet it is but part of the far bigger job: providing the finest, fastest, friendliest service to the millions who daily use the telephone.

Why not give the family a ring tonight? Rates to most points are lowest after 7 P. M. any night—and all day Sunday.

'30 John R. Gibbens, as assistant engineer in the U. S. Engineer Office, has been transferred to Norfolk, Va.

'31 Allen G. Stimson has mailed in a letter on the letter-head of the Schenectady Photographic Society of which he is president.

'34 Howard A. Staderman is instructor in radio engineering in the U. S. Army Air Corps at Scott Field, Belleville, Ill.

'35 Arthur W. Hess, with the N. P. Severin Co., has been transferred to Columbus, Ohio.

Ernest J. Welsh has returned to Louisville to work with John H. Welsh '35.

'37 Lawrence B. Carroll, with the Bell Telephone Co., has been transferred to Mt. Vernon, Ill.

'38 Adam H. Romeiser is employed in the Construction Dept. of the American Laundry Machinery Co., Chicago.

Cuttings

Again we revert to the past in an effort to give the alumni a reason for re-living their careers at Rose and to toss some inspiration in the paths of those here now. Notwithstanding the fact that our co-conspirators who returned this year have made available enough data for a comprehensive treatise on factors of stacking, the following is offered in lieu of another article along that line.

Back in 1901 the embryonic engineer must have been interested in book reviews because the May *Technic* of that year carried a separate department for this purpose. R. K. Rochester had the monthly task of editing this cultural copy. In that issue a resume of *Engineer-Practice and Theory for Steam Engineers* appeared, among others, to appeal to the aesthetic sense of the readers.

Not by any means, however, was the magazine devoted entirely to the euphemistic side of life. Sam D. Burge hit a highlight in financial matters by publishing an article entitled "The Savings Bank as an Economic Factor."

While not resorting to catch-penny schemes, large numbers of savings banks use devices to encourage laborers to save their small earnings—devices such as small banks like a child's toy bank, etc.

Wouldn't der Vater be overwhelmed if Joe brought a piggy bank home Christmas full of coppers?

It seems rather odd that the pioneer work in the present automobile industry was going on at this time. These excerpts from A. W. Clement's "Notes on Automobile Construction" may illustrate the point:

The first motor vehicles in this country were almost all underpowered. This fact may be partially explained by the introduction of vehicles of foreign make . . . . The De Dion Bouton quadricycle motor, which is one of the most popular of French machines, has a motor of 1¾ horse-power, and this maximum can be sustained for but a moment. Many of these machines have been imported and imitated. Two persons can not be carried over a very ordinary grade, however, and the driver in our country has plenty of use for the pedals which were originally provided for the purpose of starting.

"Sandow's Latest-Patent Spring Grip Dumb-Bells" were neatly advertised in this issue. It is to be admitted that when one is in the grip of spring, he acts like a dumb-bell.

Here's some competition for Western Union.

At a meeting of the Polytechnic Telegraph Co. the following officers were elected for the ensuing year:
President .....Victor Hommel
Sec. and Treas. .....Sol Levi
Superintendent....Albert A. Kreiger

The Institute seemed to be very baseball-minded at this time. None the less important to the Rose men of that day was the maintenance of the elephantine tradition at Rose. The unveiling of a new edition to carry on the noble custom took place prior to a baseball fracas with I. S. N. (yes, we walloped Normal, 6-3).

During the two recent ball games on the home grounds "The Elephant" played a very important role in the rooting. He is made of sheet-iron, charmingly decorated, bears a score-card on his side, and occupies some fifty square feet of the back-stop. He was discovered the morning of the Normal game in his present position and the way in which he got there, being a deep secret known only to three-fourths of the school, will not be here divulged.

It is strange how these elephants and lions do get around.

FIFTEEN YEARS

by Harold B. Hood, '24

At the 1939 commencement exercises, Harold B. Hood of Hood and Hahn patent attorneys of Indianapolis, presented to the graduating class a review of the interesting, unusual events which had occurred during the fifteen years intervening between his graduation and theirs.

Requested by a previous editor and graciously submitted by Mr. Hood, the first portion of the article "FIFTEEN YEARS" is hereby presented by the TECHNIC as a review of interesting events we can all recollect.

When I graduated from Rose Polytechnic Institute in June of 1924, Calvin Coolidge was the President of the United States and Germany was a Republic headed by President Ebert. No one in this country had heard of Adolf Hitler, and Russia was under the sway of Trotzky, whose power was just beginning to fade. The Fascists were already in power in Italy, but Mussolini was staying pretty much in the background, since in that year Parliament was opened by the King and Mussolini made no speech. Spain was a Military dictatorship under de Rivera. George V was King of England, and the Prince of Wales made a good will trip to the United States.

That was the year of the long and tumultuous Democratic Convention at Madison Square Garden at which Franklin Delano Roosevelt, speaking from a wheel chair, nominated Al Smith as the Democratic presidential candidate. For day after day no one would back down, until finally, on the 103rd ballot, John W. Davis, who had long trailed far behind William Gibbs McAdoo and Smith, was nominated as a compromise candidate.

Calvin Coolidge was renominated by the Republican Party with General Charles Dawes as his running mate. Radio was first used in a presidential campaign, and an official of a big radio chain remarked that unless broadcasting of politics is kept within reasonable bounds, the public will tire of it as soon as the novelty wears off. They will tune out in the middle of it and get some station that is sending jazz or a symphony concert. He also said that National hookups for political speeches were outside such reasonable bounds.

In that year Coolidge was re-elected by an enormous popular vote, and his son Calvin Coolidge Jr. died as a result of blood poisoning incurred through a tennis blister.

The United States Consul at Persia, named Imbrie, was beaten to death by a Persian mob. J. Edgar Hoover was appointed the head of the Federal Bureau of Investigation, William Howard Taft was Chief Justice of the United States, and Herbert Hoover was Secretary of Commerce. In 1924 General John Pershing retired from the Army, and 23 radio stations were hooked together in a chain for a campaign speech by Coolidge, while all other stations were kept off the air.

In California, there was organized the Pacific Coast Sportsmen's Club, which leased 50,000 acres of mountain and woodland and turned loose thereby a motley collection of game beasts and birds, including lions, tigers, etc., so that wealthy sportsmen should not have to travel to other lands to enjoy big game hunting.

Do you remember the marathon

golf craze of 1938? In 1924 Rudolf Dupan played 257 holes at Cleveland between dawn and dark. Nicholas Morris, at San Antonio, later started by moonlight and played 290 consecutive holes.

In the field of aeronautics the directional radio beam was first used by the Army Air Service between Dayton, Ohio and Moundsville, W. Va. The first dirigible, Los Angeles, was christened; and in a race between an airplane and carrier pigeons from New York to Washington, the airplane won, although it was forced to make two stops for refueling during the journey. Last November, I made that hop in a nonstop commercial plane in less than an hour and a half.

Mary Pickford, known for years as "America's Sweetheart," played the title roll in "Dorothy Vernon of Haddon Hall" in which she was supposed to be very athletic. In those days, girl golfers wore long skirts, sweeping the fairways, and girl sprinters wore wide bloomers.

How many of you, who are movie fans, know of Lillian and Dorothy Gish, Thomas Meighan, Priscilla Dean, Pola Negri, Rudolph Valentino, Gloria Swanson, Bebe Daniels, Colleen Moore, Leatrice Joy, and Barbara Lamar? These were the biggest names in filmland in 1924, and Victor McLaglen was just being hailed as a "new star". Fred Astaire and his sister Adele were appearing on Broadway in "Lady Be Good". The Marx Brothers were also on Broadway, not having crashed the movie field. They were billed not as Groucho, Chico, and Harpo, but as Julius, Leonard, and Arthur.

The world was encircled in the air. The feat required 175 days of elapsed time, 366 flying hours. This was the first crossing of the Pacific by plane as well as the first globe circling flight by plane. Transcontinental air mail on a 36 hour schedule was inaugurated and a chain of light beacons was completed from Cleveland, Ohio, to Rock Springs, Wyoming.

On the water Gar Wood established a new record of 42.06 miles per hour, while Malcolm Campbell made a new automobile record of 156.11 miles per hour. Russell Maughan flew from Long Island to San Francisco in 21 hours, 48½ minutes, another new record.

An association of radio manufacturers barred the word "broadcasting" from all further use and established the proposition that from that time forward the art of wireless telephony should be referred to as "radiocasting". The New York Yankees lost the American pennant for the first time in four years, and the Washington Senators defeated the New York Giants in the World Series.

In 1924 Dr. David Todd, Professor Emeritus at Amherst College, discovered a mass of sun spots, stated that a crack was becoming visible, and predicted the early separation of the sun into separate bodies.

Red Grange was the idol of the Illinois football fans and Bobby Jones won his first National Amateur Golf Championship.

Von Hindenburg was elected to the Presidency of the German Republic in 1925 upon the death of

Friedrich Ebert. Ma Ferguson, wife of the ex-Governor of Texas who had lost his citizenship, was inaugurated Governor while Nellie Taylor Ross occupied the Governor's Mansion in Wyoming.

The State of Tennessee legislated against the theory of evolution. John T. Scopes, a young high school teacher, defied the legislative edict, thus bringing about one of the most famous trials of history, in which the prosecution was headed by William Jennings Bryan and the defense by Clarence Darrow. During the trial Bryan died, presumably of over-exertion.

The United States submarine S-51 was rammed by a coastwise steamer and sank with the loss of 34 of the 37 men aboard.

In that year a Chevrolet, which was advertised as having an extremely rapid pickup, was matched against various other automobiles at 100 yard dashes, and won them all, but when it was matched against Keith Lloyd, a sprinter, the best the automobile could do was to tie the human.

Our first airplane carrier, the Saratoga, was launched at Camden, New Jersey, April 7, 1925. In that year two seaplanes set out from Pablo Bay, California to Honolulu. One plane failed and landed safely on the ocean 400 miles out from Pablo Bay, where it was quickly salvaged by one of the ships which had been spotted along the course. The other plane got off the course, exhausted its fuel, and was lost for 9 days. The Commander of the latter plane had carried with him, merely to please his Mother, a small still which she had procured for him; and that fact preserved the lives of all of the members of the plane crew, since it made possible the production of sweet water from sea water.

An American Curtiss airplane established a new speed record of 302.3 miles an hour, and in that year, the dirigible Shenandoah, on a routine flight over relatively flat country, was torn apart in the air by colliding air currents with the loss of 14 of its crew.

In the World Series the Pittsburgh Pirates defeated the Washington Senators 4 games to 3 by winning the last two games of the series. Earl Sande, up on Flying Ebony, won the Kentucky Derby, and Peter de Paolo Jr., won the Indianapolis Motor Classic at an average speed of 101.13.

A German woman chemist and her two assistants announced the isolation of two new elements, massurium and rhenium. Electric refrigerators began to come into household use, and most of the United States was treated to the spectacle of a total eclipse of the sun.

(This concludes the first two years of Mr. Hood's review of "Fifteen Years". The article will be continued in the next issue.)

Fraternity Notes

Theta Xi

The close of the Rose football season, one of the best in years, marked the end of four years of play for three members of the Theta Xi fraternity. They are Captain George Harper, Ray Hogan, and Al Klatte. Harper and Hogan were four letter men. Klatte won three varsity letters in football. Ed Klecka worked efficiently as manager during the last four seasons.

Klatte won the state individual scoring race with a total of 60 points and was chosen fullback on the All State Eleven picked by the Associated Press.

On November 18 Michael Percopo of Brooklyn, New York, class of '43, and Eldred Beckman, a senior in the mechanical engineering department from Chicago, Illinois, were formally initiated into Kappa Chapter of Theta Xi.

Kappa's first formal dance of the season was held on Dec. 14 at the Deming Ball Room with Jimmie Maxwell's orchestra furnishing the music. Chaperons for this affair were Dr. and Mrs. Donald Prentice, Dr. and Mrs. O. S. Knight, and Professor and Mrs. E. A. McLean. Arrangements for this affair were in the hands of Social Chairman Fred Wehle.

The Chapter was recently honored by a visit by Charles Scharpenburg, of Bakersfield, Calfornia. Mr. Sharpenburg was the second man initiated into Kappa Chapter of Theta Xi.

Alpha Tau Omega

Gamma Gamma chapter is very happy to announce the pledging of William Kahn, Sophomore in the Chemical Engineering Department. Bill comes from Riverside, Ill., and has a brother who is an ATO and a graduate of Rose.

ATO is certainly proud of the record made by the Rose football team this past season. The chapter wishes to congraulate Brother John Combs who at the close of the season finished up four very successful years as regular tackle on the team. John played most of the time in every game and was always a constant menace to his opponents. Congratulations are also due Earl Michaels and Harold Bowsher who were elected co-captains of next year's team. These two men were also placed on the 1940 All-State team.

The chapter is planning a big Christmas party as a prelude to the Christmas holidays in the form of a formal dance Friday evening, December 20. Plans and arrangements are in charge of John Carroll, social chairman. The dance will be held in the Mayflower Room of the Terre Haute House, and Wayne McIntyre's orchestra will furnish the music.

At the December dinner meeting the chapter was happy to have as its guests Dr. Sousley and Professor Knipmeyer. A most enjoyable dinner was served by the Mother's Club after which several stories and songs were enjoyed by all those present.

With the basketball season well under way we hope the Engineers will be able to turn loose some of their potential scoring power this season and bring home some well deserved victories. ATO is represented on the team this year by four returning lettermen from last year's squad; Dreher, Bowsher, Brown and Mehagan.

Lambda Chi Alpha

Theta Kappa Zeta met with considerable success in their attempt to give their first open house November 15. The party was chaperoned by Dr. and Mrs. Sousley, and Professor and Mrs. Stock. On arrival, everyone was given somewhat of a surprise when they found a new combination phonograph and radio which was to afford the music for the evening. The radio, which was a gift of alumni, Mr. Russel Archer and Mr. Charles Evinger, is now a permanent house furnishing. Plans are now under progress for another open house to be given in the near future.

In the past few weeks several improvements have been made on the

house. Several portions have been remodeled, and others redecorated so as to be more suitable for their purpose.

The chapter as always extends a cordial invitation to its alumni to visit them and offer any suggestions for improvements that they feel may be helpful.

Sigma Nu

Beta Upsilon Chapter of Sigma Nu is happy to announce the pledging of Herbert E. Wrancher and Carlos A. Moore. Herbert is a sophomore student in the Electrical Engineering Department and resides at Indianapolis, Indiana. Carlos is a sophomore Mechanical Engineering student from Clinton, Indiana.

The chapter was pleased to hear that pledges Jack Warrick and Bob Mitchell are to receive letters in football.

Plans are being made by Brother Clay Riley, who is house president, for the redecoration of the chapter house.

On Dec. 20, Friday, before Christmas holidays begin, there will be a dinner held at Antonini's in Clinton. Following the dinner there will be a smoker at the house. Bridge, ping-pong, and other activities will be enjoyed by all.

Tau Beta Pi

Tau Beta Pi is a national honorary fraternity for engineers and engineering students. There are now seventy-two active chapters of Tau Beta Pi with a total membership of 34,000. Chapters are established all over the country in colleges where accepted enginering courses are offered.

November 7, the Rose chapter held initiation for six men—Eldred Beckman, W. Edwin Barrick, John E. Tracy, James R. Brown, Harold B. Frist, and Benjamin K. Sollars. Of these, the seniors were required to stand in the upper quarter of their class, and the juniors in the upper eighth of their class. Character is considered in choosing the members.

TAU BETA PI ELECTS NEW MEMBERS

The Indiana Beta chapter of Tau Beta Pi at Rose now numbers eleven men. Reading from left to right, they are, seated: H. Rolland Buell, Benjamin K. Sollars, Raymond C. Hogan, president, Quentin R. Jeffries and Charles A. Howlett. Standing: John E. Tracy, Eldred Beckman, James R. Brown, W. Edwin Barrick, George R. Schull, and Harold B. Frist.

Members who were active before the initiation are Raymond C. Hogan, president of Tau Beta Pi, Charles A. Howlett, Quentin R. Jeffries, George Schull and H. Rolland Buell. The next pledging to Tau Beta Pi will be held about the last week in February.

To become a Tau Beta Pi is considered one of the highest honors available at Rose. Although freshmen and sophomores are not eligible, it is during the first years of engineering education that the record is made upon which possible membership is dependent. So freshmen and sophomores, don't give up hope—perhaps even you can enter the select group some day.

SLY -- DROOLINGS

edited by Ralph E. Brown, m.e., '43

Ker: "I dreamed about you last night."

She: "Yes?"

Ker: "Yes . . . then I got up, closed the window, and put an extra blanket on the bed."

Alice: "What's your father's occupation, Bill?"

Bill: "My father's a cop; but I'm no flop."

Alice: "My father's a baker; but I'm no quaker."

Fred: "Huh, my father's a chauffer, but I'm no loafer."

Helen: "Er-ah, my father's a surgeon."

They say a hug is energy gone to waist.

"I've just taken a shine to your wife," said the stork to the negro when leaving the house.

Suitor: "Suh, I want your daw'ter fur my wife."

Father: "No suh, I don't think I wants to trade."

By the time a wise guy is old enough to marry, a fool has children big enough to support him.

Editor: "Give me a sentence with the word 'discrepancy' in it."

Yours truly: "Read discrepancy how you like it."

Doctor Sousley: "I hope I haven't talked too long, but I haven't my glasses and I can't see my watch."

Pera: "Why don't you look at the calendar?"

Some one told us that Bowsher ruined the mechanical calculator in the Civil Lab. He divided a number by zero and burned out the bearings.

Headline: Burglar raids debutante's room and steals all her lingerie. (Quite an undi-taking no doubt.)

The gas company in a small college town has inserted the following advertisement in the local newspaper:

"Wanted: Hard boiled beauty-proof man to read meters in sorority houses. We haven't made a dollar in two years."

A wealthy, elderly bachelor advertised for a wife to share his estate in return for bearing him an heir. Four years passed and the villagers decided the woman had misrepresented herself. When questioned she replied, "The old man is indeed heir-minded; but he is far from being heir-conditioned."

Schull: "A girl's greatest attraction is her hair."

Nichols: "Nope, I think it's her smile. What do you think, Eddie?"

Cook: "I think the same as you guys do, but I'll be d——if I'll lie about it."

"Do you know anything about Latin syntax?"

"Did they have a national defense tax, too."

Professor: "Describe the mechanism of a steam shovel."

Stude: "Don't kid me. You can't carry steam on a shovel."

Alice: "I can't go to the masquerade with Lyndon."

Friend: "Why not?"

Alice: "I'm going in my Hawaiian costume and he's going as a harvest hand."

A girlie whose name doesn't matter,
Found that she got fatter and fatter
But she dieted so well
That she now looks like hell,
And there isn't a place you can patter.

She: "Who said you could kiss me, Winston?"

Winston: "Everybody."

He: "Where can I get hold of you?"

She: "I don't know; I'm awfully ticklish."

A kiss is a peculiar proposition. Of no use to one, yet absolute bliss to two. The small boy gets it for nothing, the young man has to lie for it, and the old man has to buy it; the baby's right, the lover's privilege, and the hypocrite's mask. To a young girl, faith; to a married woman, hope; and to an old maid, charity.

Friend: "But isn't your son sort of listless, Mr. Strassel?"

Mr. Strassel: "Oh, no! He's got a list of blonds, a list of brunettes, and a list of redheads."

Friend: "Which of your works of fiction do you consider the best?"

Author: "My last income tax return."

Local Woman: "My husband is the only man who ever kissed me."

Neighbor: "Are you bragging or complaining?"

You can't eat your cake and have IT.

Dere ain't no justice in dis here land,
Ah got a divorce from mah old man
But I laughed at the court's decision
They gave him the kids, and dey ain't his'n.

G-E Campus News

MICROANALYSIS

IN ordinary chemical analysis, where material is plentiful, the work is done on a scale most suitable for obtaining the results sought. Samples are relatively abundant; they may be used prodigally.

Not always, however, is the material for test so plentiful. The General Electric Research Laboratory at Schenectady, N. Y., handles the exceptions with its facilities for "microchemistry," in which the amount of test material available controls both the scale of operations and the strategy of attack. Microanalyst Charles Van Brunt, Harvard, '92, of the laboratory staff is prepared to test material whose limit in smallness is set only by the refinements of manipulation attainable under the microscope with the aid of a "micromanipulator."

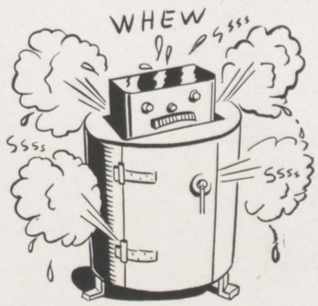
Seldom does Van Brunt attempt to identify or classify materials in solution volumes less than a cubic millimeter (about the size of a pinhead). But to analyze an ordinary drop, as delivered from a medicine dropper, is comparatively coarse work for him—near the upper limit of the true microchemical range.

FROZEN LIGHT

THE "late" Baron Munchausen was accredited (by himself) with incredible feats among which was freezing the ring of a bell. Recently, however, General Electric Research Laboratory scientists at Schenectady, N. Y., outdid the Baron by freezing light.

In producing this frozen light, G-E scientists submerged fluorescent plates in a large thermos bottle of liquid air with a temperature of 320 degrees below zero. The bottle and the plates were then bombarded by x-rays, exciting the atoms of fluorescent material on the plates literally freezing them stiff. When the plates were removed and allowed to warm up, they glowed with all the colors of the rainbow.

A "bottle" of frozen light was sent to East Orange, N. J., where it was unveiled in connection with the ceremonies marking the premiere of the motion picture, "Edison, The Man."



RADIO TURKISH BATH

RATS and moisture seem to be the two chief enemies of radio sets in the tropics. A letter from the Belgian Congo testifies to the rats; the evidence for the humidity is already ample. Except for recommending traps, there is little the General Electric Company can do about the rats, but the study of humidity is right up its alley since G-E engineers at Bridgeport, Conn., have built a humidity chamber capable of reproducing the weather conditions of the tropics.

Lamps under water tanks provide humidity by vaporization, and generate enough heat to maintain a temperature of about 100 F. Humidity and temperature are controlled by time clocks outside the sealed chamber, while uniform weather conditions are maintained within the chamber by circulating fans.

Radio receivers placed in this room are continuously subjected to conditions far more severe than those of the tropics until failures occur in the sets. In this way, young engineering college graduates enrolled in the G-E Test Course gather data which contribute to the improvement of radio, not only in the tropics, but everywhere that radios are used.

GENERAL ELECTRIC

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